CLAIMS

What is claimed is:

1. A method for increasing upstream communication in an optical network comprising the steps of:

receiving serial electrical data;

formatting the serial electrical data with a network protocol;

encoding the formatted data with a predetermined coding scheme for providing adequate transitions per code group of the data to facilitate clock recovery;

increasing a speed to remove direct current components from the serial data by adjusting a time constant of a first portion of a driver circuit according to a predetermined frequency of the data that is dependent upon the network protocol and encoding scheme;

increasing a speed to convert the serial encoded data in to the optical domain by adjusting a time constant of a second portion of the driver circuit according to the predetermined frequency;

increasing a speed to power up an optical transmitter by adjusting a time constant of a power level circuit according to the predetermined frequency; and

converting the encoded electrical data into optical data.

2. The method of Claim 1, wherein the step of formatting the electrical data comprises the step of formatting the electrical data according to a Gigabit Ethernet protocol.

3. The method of Claim 1, further comprising the step of propagating the optical data in accordance with a predetermined timing scheme comprising time division multiple access (TDMA).

4. The method of Claim 1, wherein the predetermined frequency of the data comprises an occupied frequency of the protocol when the data comprises a maximum number of like bits permitted by the protocol.

5. The method of Claim 1, wherein the step of encoding the formatted data with a predetermined coding scheme comprises encoding the formatted data in accordance with an 8B/10B coding scheme.

6. The method of Claim 1, wherein the step of increasing the speed to remove direct current (dc) components from the serial data comprises adjusting a time constant of a high pass filter circuit of the driver circuit.

7. The method of Claim 6, wherein the step of adjusting a time constant of a high pass filter circuit comprises lowering the time constant by decreasing capacitance of the high pass filter to correspond with the predetermined frequency of the data.

8. The method of Claim 1, wherein the step of increasing the speed to convert the serial encoded data in to the optical domain comprises adjusting a time constant of a high pass filter circuit of the driver circuit.

9. The method of Claim 8, wherein the step of adjusting a time constant of the high pass filter of the driver circuit comprises lowering the time constant by decreasing capacitance of the high pass filter circuit to correspond with the predetermined frequency of the data.

10. The method of Claim 1, wherein the step of increasing the speed to power up an optical transmitter comprises adjusting a time constant of a high pass filter circuit of the power level circuit.

11. The method of Claim 10, wherein the step of adjusting a time constant of a high pass filter circuit comprises lowering the time constant by decreasing

capacitance of the high pass filter circuit to correspond with the predetermined frequency of the data.

12. A method for increasing upstream communication in an optical network comprising the steps of:

receiving an optical signal that is formatted according to a network protocol and predetermined timing scheme and having a predetermined encoding;

increasing a speed in which a detecting circuit can receive optical signals by adjusting a time constant;

increasing a speed in which the detecting circuit can adjust between different optical signals by adjusting a time constant;

increasing a speed in which a limiting circuit can convert optical signals to electrical signals by adjusting a time constant; and

converting the optical signals to electrical signals.

13. The method of Claim 12, wherein the step of receiving optical signals comprises receiving optical signals formatted according to a Gigabit Ethernet standard.

14. The method of Claim 12, wherein the step of receiving optical signals comprises receiving optical signals encoded according to 8B/10B encoding.

15. The method of Claim 12, wherein the step of receiving optical signals comprises receiving optical signals formatted according to a time division multiple access protocol.

16. The method of Claim 12, wherein the step of increasing a speed in which a detecting circuit can receive optical signals comprises decreasing a time constant by decreasing capacitance of a photodetector circuit to correspond with a predetermined frequency of the data.

17. The method of Claim 12, wherein the step of increasing a speed in which the detecting circuit can adjust between different optical signals comprises decreasing

a time constant by decreasing capacitance of a gain control circuit to correspond with a predetermined frequency of the data.

18. The method of Claim 12, increasing a speed in which a limiting circuit can convert optical signals to electrical signals comprises decreasing a time constant by decreasing capacitance of the limiting circuit to correspond with a predetermined frequency of the data.

19. An optical transmitter comprising:

a driver circuit for receiving electrical data;

a laser transmitter for receiving data from the driver circuit and for converting the electrical data into optical data that is transmitted according to a time division multiple access protocol;

a power level circuit for supplying electrical energy to the laser transmitter; and

a processor for controlling the driver circuit and the power level circuit in accordance with the time division multiple access protocol[SPW1].

20. The optical transmitter of Claim 19, wherein the laser transmitter is adjusted to handle a predetermined frequency of the data that comprises an occupied frequency of a Gigabit Ethernet protocol when the data comprises a maximum number of like bits permitted by the protocol.

21. The optical transmitter of Claim 19, wherein the power level circuit is adjusted to handle a predetermined frequency of the data that comprises an occupied frequency of a Gigabit Ethernet protocol when the data comprises a maximum number of like bits permitted by the protocol.

22. The optical transmitter of Claim 19, wherein the driver circuit is adjusted to handle a predetermined frequency of the data that comprises an occupied frequency of a Gigabit Ethernet protocol when the data comprises a maximum number of like bits permitted by the protocol.

23. An optical receiver comprising:

a photodiode detector circuit for receiving optical data transmitted according to a time division multiple access protocol;

an automatic gain control circuit for adjusting a gain of the photodiode detector circuit; and

a limiting circuit for converting the received optical data into electrical data that is transmitted according to a time division multiple access (TDMA) protocol[SPW2].

24. The optical receiver of Claim 23, wherein the photodiode circuit is adjusted to handle a predetermined frequency of the data that comprises an occupied frequency of a Gigabit Ethernet protocol when the data comprises a maximum number of like bits permitted by the protocol.

25. The optical receiver of Claim 23, wherein the automatic gain control is designed to a predetermined frequency of the data that comprises an occupied frequency of a Gigabit Ethernet protocol when the data comprises a maximum number of like bits permitted by the protocol.

26. The optical receiver of Claim 23, wherein the limiting circuit is designed to a predetermined frequency of the data that comprises an occupied frequency of a Gigabit Ethernet protocol when the data comprises a maximum number of like bits permitted by the protocol.

27. An optical transmitter comprising:

a driver circuit for receiving electrical data;

a laser transmitter for receiving data from the driver circuit and for converting the electrical data into optical data that is transmitted according to network protocol other than SONET;

a power level circuit for supplying electrical energy to the laser transmitter; and

a processor for controlling the driver circuit and the power level circuit in accordance with the time division multiple access protocol.

28. The optical transmitter of Claim 27, wherein the network protocol other than SONET comprises Gigabit Ethernet[SPW3].

29. The optical transmitter of Claim 27, wherein the driver circuit, laser transmitter circuit, and power level circuit are designed to a predetermined frequency of the data that comprises an occupied frequency of a Gigabit Ethernet protocol when the data comprises a maximum number of like bits permitted by the Gigabit Ethernet protocol.

30. The optical transmitter of Claim 29, wherein each circuit has a time constant that corresponds with the predetermined frequency.